What is claimed is:

1. A semiconductor laser module comprising:

a semiconductor laser element;

a thermo-module for adjusting the temperature of the semiconductor laser element in dependence upon an amount of current flowing into said thermo-module; and,

at least one of an overcurrent limiting circuit to suppress an overcurrent flowing into the thermo-module and an overvoltage limiting circuit to suppress application of an overvoltage across said thermo-module.

2. A semiconductor laser module as defined in Claim 1, comprising an optical fiber optically coupled for receiving laser light emitted from the semiconductor laser element;

3. A semiconductor laser module as defined in Claim 1, comprising a reverse current flow prevention circuit for preventing current from flowing into said thermo-module in a direction opposite to that of a drive current of said thermo-module.

4. A semiconductor laser module as defined in Claim 3, wherein the surge suppression circuit comprises a diode disposed in series with said thermo-module.

5. A semiconductor laser module as defined in Claim 4, comprising a surge suppression circuit for preventing surge current from flowing into said thermo-module.

6. A semiconductor laser module as defined in Claim 1, wherein the thermo-module comprises:

at least an element for alternatively heating and cooling in dependence upon a direction of current flowing therein, and wherein the overcurrent limiting circuit is electrically coupled with the at least an element to divert current flowing thereto and oriented for causing heating.

7. A semiconductor laser module as defined in Claim 6, wherein the overcurrent limiting circuit includes:

a diode disposed serially to the thermo-module and oriented for allowing current to flow therethrough when the flowing current is oriented in a direction for causing cooling of thermo-module; and

a current limiting circuit element coupled in parallel to the thermo-module.

8. A semiconductor laser module as defined in Claim 7, wherein the overcurrent limiting circuit includes a capacitor disposed in a bypass circuit parallel to the thermo-module.

9. A semiconductor laser module as defined in Claim 6, wherein the overcurrent limiting circuit includes:

a bypass channel between an upstream side and a downstream side of the thermo-module for bypassing the thermo-module; and

a diode disposed within the bypass channel and oriented for allowing current to flow therethrough when the flowing current is oriented in a direction for causing heating of the thermo-module;

wherein in use circuit elements within the bypass channel and the diode provide an overcurrent limiting circuit to relieve the flow of an overcurrent in the direction for causing heating in the thermo-module.

10. A semiconductor laser module as defined in Claim 9, wherein the overcurrent limiting circuit includes a resistor disposed within the bypass channel serially to the diode.

11. A semiconductor laser module as defined in Claim 10, comprising a surge suppression circuit in parallel to the bypass path for preventing surge current from flowing into said thermo-module.

12. A semiconductor laser module as defined in Claim 9, wherein the overcurrent limiting circuit includes:

a zener diode disposed serially to the diode within the bypass channel and oriented opposite to the diode for providing an approximately fixed zener voltage when the flowing current is oriented in a direction for causing heating of thermo-module;

wherein in use the bypass channel, resistor and diode provide an overcurrent limiting circuit to relieve the flow of an overcurrent in the heating direction into said thermo-module.

13. A semiconductor laser module as defined in Claim 12, comprising a surge suppression circuit in parallel to the bypass path for preventing surge current from flowing into said thermo-module.

14. A semiconductor laser module as defined in Claim 13 wherein the surge suppression circuit comprises a capacitor.

15. A semiconductor laser module as defined in Claim 12 comprising:

a package for storing therein the semiconductor laser element, the thermo-module, and at least part of the optical fiber, the thermo-module being mounted on a first plate of the package, wherein the thermo-module comprises a first substrate adjacent the first plate, a second substrate and a Peltier element disposed therebetween;

wherein the semiconductor laser element is disposed on the second substrate and thermally connected to said thermo-module and

wherein the overcurrent limiting circuit is disposed on at least one of the first substrate and the first plate.

16. A semiconductor laser module as defined in Claim 1 comprising:

a package for storing therein the semiconductor laser element, the thermo-module, and at least part of the optical fiber, the thermo-module being mounted on a first plate of the package, wherein the thermo-module comprises a first substrate adjacent the first plate, a second substrate and a Peltier element disposed therebetween;

wherein the semiconductor laser element is disposed on the second substrate and thermally connected to said thermo-module and

wherein the overcurrent limiting circuit is disposed on at least one of the first substrate and the first plate.

17. A semiconductor laser module as defined in Claim 16 wherein:

said thermo-module is arranged in such a manner that the first substrate is extended relative to the second substrate, and comprising a first conductor pattern and a second conductor pattern of said thermo-module disposed on an extended portion of the first substrate and

wherein one end side of said overcurrent limiting circuit is coupled to said first conductor pattern and the other end side of said overcurrent limiting circuit is coupled to said second conductor pattern.

18. A semiconductor laser module as defined in Claim 16, comprising:

at least another Peltier element between the first substrate and second substrate;

an optical fiber; and

a lens for focussing laser light emitted from the semiconductor laser and for directing said laser light into the optical fiber, wherein said lens is thermally connected by a thermally melting connection material to the second substrate of said thermo-module.

19. A semiconductor laser module as set forth in Claim 18 comprising:

a package having a through hole communicating from the inside of the package to the outside thereof;

an optical fiber supporting member disposed within the through hole;

wherein an end portion side of the optical fiber is for being introduced from the outside of said package into the inside thereof via a through hole provided in said optical fiber supporting member, and wherein the first substrate is thermally isolated from said optical fiber supporting member.

20. A semiconductor laser module as defined in Claim 16, comprising:
a lensed optical fiber in which a lens is formed at the tip end portion onto which laser light is incident.

21. A semiconductor laser module as set forth in Claim 1 comprising:

a package having a through hole communicating from the inside of the package to the outside thereof for accommodating the semiconductor laser element and the thermo-module;

an optical fiber supporting member disposed within the through hole;

wherein an end portion side of an optical fiber is for being introduced from the outside of said package into the inside thereof via a through hole provided in said optical fiber supporting member, and wherein the first substrate is thermally isolated from said optical fiber supporting member.

22. A semiconductor laser module as defined in Claim 21, comprising a lensed optical fiber in which a lens is formed at the tip end portion onto which laser light is incident.

23. A semiconductor laser module as defined in Claim 9 comprising:

a package for storing therein the semiconductor laser element, the thermo-module, and at least part of the optical fiber, the thermo-module being mounted on a first plate of the package, wherein the thermo-module comprises a first substrate adjacent the first plate, a second substrate and a Peltier element disposed therebetween;

wherein the semiconductor laser element is disposed on the second substrate and thermally connected to said thermo-module and

wherein the overcurrent limiting circuit is disposed on at least one of the first substrate and the first plate.

24. A semiconductor laser module as defined in Claim 23 wherein:

said thermo-module is arranged in such a manner that the first substrate is extended relative to the second substrate, and comprising a first conductor pattern and a second conductor pattern of said thermo-module disposed on an extended portion of the first substrate and

wherein one end side of said overcurrent limiting circuit is coupled to said first conductor pattern and the other end side of said overcurrent limiting circuit is coupled to said second conductor pattern.

25. A method for driving a semiconductor laser module having a semiconductor laser element, and a thermo-module for adjusting the temperature of the semiconductor laser element comprising the steps of:

thermally connecting said thermo-module to said semiconductor laser element;

adjusting the temperature of the semiconductor laser element in dependence upon an amount of current flowing into the thermo-module; and

suppressing some of an overcurrent flowing into the thermo-module by providing an overcurrent flow limiting circuit for the thermo-module.

26. A method for driving a semiconductor laser module as defined in Claim 25 wherein the thermo-module is constructed so that it provides heating and cooling in dependence upon an orientation of a current flow within the thermo-module and wherein the step of suppressing some of an overcurrent flowing into the thermo-module by providing an overcurrent flow limiting circuit for the thermo-module is performed only for current flowing in an orientation for causing heating.

27. A method for driving a semiconductor laser module as defined in Claim 26 wherein the overcurrent flow limiting circuit comprises a bypass path in parallel to the thermo-module and wherein the step of suppressing some of an overcurrent flowing into the thermo-module by providing an overcurrent flow limiting circuit for the thermo-module is performed only when more than a predetermined voltage is provided across the thermo-module.

28. A method for driving a semiconductor laser module as defined in Claim 27 wherein the overcurrent flow limiting circuit comprises a zener diode within the bypass path for maintaining the voltage across the thermo-module below a predetermined voltage.

29. A method for driving a semiconductor laser module as defined in Claim 26 wherein the overcurrent flow limiting circuit comprises a bypass path in parallel to the thermo-module and

wherein the step of suppressing some of an overcurrent flowing into the thermo-module by providing an overcurrent flow limiting circuit for the thermo-module is performed only when a surge current having high frequency components is provided to the thermo-module.

30. A method for driving a semiconductor laser module as defined in Claim 26 wherein the overcurrent flow limiting circuit comprises a bypass path in parallel to the thermo-module comprising a resistor and wherein the step of suppressing some of an overcurrent flowing into the thermo-module by providing an overcurrent flow limiting circuit for the thermo-module is performed by redirecting an approximately fixed fraction of current flow within the thermo-module in the heating direction to the bypass path.

31. A transmission device comprising:

an optical module having an optical element a characteristic of which is influenced by heat;

a thermo-module for variably adjusting the temperature of the optical element in dependence upon an amount of a current flowing into said thermo-module; and

at least one of an overcurrent limiting circuit which suppresses an overcurrent from flowing into said thermo-module and an overvoltage limiting circuit which suppresses overvoltage from being applied to said thermo-module is provided.

32. A transmission device as set forth in Claim 31, wherein at least one of the at least one overcurrent limiting circuit and overvoltage limiting circuit is provided in a power source apparatus.

33. A transmission device as set forth in Claim 31, wherein at least one of the at least one overcurrent limiting circuit and overvoltage limiting circuit comprises a diode having an orientation in a heating direction of the thermo-module and a Zener diode having an orientation opposite to the orientation of the diode, the diode and the zener diode coupled in series in parallel to the thermo-module.

34. A transmission device as set forth in Claim 33, wherein said overcurrent limiting circuit is disposed in the power source device of said optical module.

35. A thermo-module for variably controlling a temperature of an object in dependence upon an amount of a current supplied thereto comprising:

a first substrate;

a second substrate;

a plurality of Peltier elements between the first and second substrate; and

an overcurrent limiting circuit,

wherein the first substrate is extended relative to the second substrate and wherein the overcurrent limiting circuit is disposed on the extended portion of the first substrate.

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